WHAT IS CLAIMED IS:

1. A synchronization acquiring circuit for receiving a baseband signal transferred as an intermediate frequency signal obtained by down-converting a received radio wave and for acquiring a radio frequency channel, comprising:

a plurality of pattern detection means disposed in parallel each performing an operation of receiving the baseband signal transferred by the intermediate frequency signal in a different frequency range and detecting a predetermined frame synchronization pattern; and

carrier recovery means for establishing a frame synchronization and recovering a carrier to be used for removing a frequency error of the baseband signal when one of said plurality of pattern detection means detects the frame synchronization pattern.

2. A synchronization acquiring circuit for receiving a baseband signal transferred as an intermediate frequency signal obtained by down-converting a received radio wave and for acquiring a radio frequency channel, comprising:

first pattern detection means for receiving the baseband signal transferred by the intermediate frequency signal in a predetermined frequency range and detecting a predetermined frame synchronization pattern;

second pattern detection means for receiving the baseband signal transferred by the intermediate frequency signal in a frequency range higher than the frequency range of the intermediate frequency signal transferring the baseband signal from which said first pattern detection means can detect the frame synchronization pattern, and detecting the predetermined frame synchronization pattern;

third pattern detection means for receiving the baseband signal transferred by the intermediate frequency signal in a frequency range lower than the frequency range of the intermediate frequency signal transferring the baseband signal from which said first pattern detection means can detect the frame synchronization pattern, and detecting the predetermined frame synchronization pattern; and

carrier recovery means for establishing a frame synchronization and recovering a carrier to be used for removing a frequency error of the baseband signal when one of said first to third pattern detection means detects the frame synchronization pattern.

3. A synchronization acquiring circuit according to claim 2, wherein each of said first to third pattern detection means comprises;

signal conversion means for specifying a phase of the received baseband signal and converting the phase into a digital signal corresponding to the specified phase; and

signal decision means for deciding whether the digital signal generated through conversion by said signal conversion means contains the predetermined frame synchronization pattern.

4. A synchronization acquiring circuit according to claim 3, wherein:

said signal conversion means has:

eight de-mapping means each for specifying the phase of the baseband signal on a phase plane having a decision criterion border line whose phase is rotated by = 45° x n (where n is an integer of 0 to 7) and obtaining the converted digital signal, the decision criterion border line being used for specifying a value of the converted digital signal corresponding to the specified phase of the baseband signal; and

said signal decision means has:

eight sequence decision means for deciding whether each digital signal sequence generated through conversion by each of said eight de-mapping means contains the predetermined frame synchronization pattern; and

means for notifying said carrier recovery means of that the frame synchronization pattern was detected, if at least one of said eight sequence decision means decides that the digital signal sequence contains the predetermined frame synchronization pattern.

5. A synchronization acquiring circuit according to any one of claims 2, 3 and 4, wherein:

each of said first to third pattern detection means comprises:

waveform data making means for creating waveform data to be used for rotating a phase of the baseband signal; and

complex calculation means for rotating the phase of the baseband signal by executing a complex number calculation between the waveform data created by said waveform making means and the received baseband signal; and

said carrier recovery means comprises:

identification means for identifying one of said first to third pattern detection means which detected the frame synchronization pattern;

signal selection means for selecting the baseband signal whose phase was rotated by said complex calculation means of one of said first to third pattern detection means identified by said identification means;

phase error identification means for identifying a phase error by comparing the phase of the baseband signal selected by said signal selection means and an absolute phase;

frequency error identification means for identifying a frequency error contained in the baseband signal in accordance with the phase error identified by said phase error identification means; and

carrier recovery means for recovering a carrier to be used for removing the phase error and frequency error contained in the baseband signal, by controlling said waveform data making means of one of said first to third pattern detection means identified by said identification means in accordance with the phase error identified by said phase error identification means and the frequency error identified by said frequency error identification means.

6. A synchronization acquiring circuit for receiving a baseband signal transferred as an intermediate frequency signal obtained through frequency conversion of a received radio wave and for acquiring a radio frequency channel of BS digital broadcasting, wherein:

the baseband signal is received which contains a frequency error corresponding to a whole frequency range of the intermediate frequency signal, the baseband signal being used for acquiring the radio frequency channel, a frame synchronization pattern is detected through conversion into a digital signal and in correspondence with the frequency error, and a carrier synchronized with a frequency of the baseband signal is recovered in accordance with a range of the frequency error contained in the baseband signal from which the frame synchronization pattern was detected, to thereafter establish a frame synchronization.

7. A synchronization acquiring circuit for receiving a baseband signal transferred as an intermediate frequency signal obtained by down-converting a received radio wave and for acquiring a radio

frequency channel, comprising:

signal conversion means for identifying a phase of a received baseband signal phase-modulated in a symbol unit and converting the baseband signal into a digital signal corresponding to the identified phase;

a plurality of pattern detection means disposed in parallel for detecting a predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said signal conversion means, each of said plurality of pattern detection means being related to a frequency of the intermediate frequency signal in a different frequency range; and

frequency control means for changing the frequency of the baseband signal by using an off-set frequency corresponding to a frequency error contained in the baseband signal, when one of said plurality of pattern detection means detects the frame synchronization pattern, and for establishing a frame synchronization after said signal conversion means identifies the phase of the baseband signal.

8. A synchronization acquiring circuit for receiving a baseband signal transferred as an intermediate frequency signal obtained by down-converting a received radio wave and for acquiring a radio frequency channel, comprising:

first pattern detection means for detecting a predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said signal conversion means, if a center frequency of a range assigned to the radio frequency channel corresponds to a frequency of the intermediate frequency signal in a predetermined frequency range;

second pattern detection means for detecting the predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said signal conversion means, if the center frequency of the range assigned to the radio frequency channel corresponds to the frequency of the intermediate frequency signal in a frequency range higher than the frequency range of the intermediate frequency signal from which said first pattern detection means can detect the frame synchronization pattern;

third pattern detection means for detecting the predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said signal conversion means, if the center frequency of the range assigned to the radio frequency channel corresponds to the frequency of the intermediate frequency signal in a frequency range higher than the frequency range of the intermediate frequency signal from which said second pattern detection means can detect the frame synchronization pattern;

fourth pattern detection means for detecting the predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said signal conversion means, if the center frequency of the range assigned to the radio frequency channel corresponds to the frequency of the intermediate frequency signal in a frequency range lower than the frequency range of the intermediate frequency signal from which said first pattern detection means can detect the frame synchronization pattern;

fifth pattern detection means for detecting the predetermined frame synchronization pattern transferred by the baseband signal, in accordance with the digital signal generated through conversion by said

signal conversion means, if the center frequency of the range assigned to the radio frequency channel corresponds to the frequency of the intermediate frequency signal in a frequency range lower than the frequency range of the intermediate frequency signal from which said first fourth detection means can detect the frame synchronization pattern; and

frequency control means for transforming the frequency of the baseband signal by using an off-set frequency corresponding to a frequency error contained in the baseband signal, when one of said first to fifth pattern detection means detects the frame synchronization pattern, for making said signal conversion means identify a phase of the baseband signal, and for making said first pattern detection means detect the frame synchronization pattern to thereafter establish a frame synchronization.

9. A synchronization acquiring circuit according to claim 8, wherein:

said signal conversion means has:

eight de-mapping means each for specifying the phase of the baseband signal on a phase plane having a decision criterion border line whose phase is rotated by = 45° x n (where n is an integer of 0 to 7) and obtaining the converted digital signal, the decision criterion border line being used for specifying a value of the converted digital signal corresponding to the specified phase of the baseband signal;

said first pattern detection means has:

eight sequence decision means each for deciding whether each digital signal sequence generated through conversion by each of said eight de-mapping means contains the predetermined frame synchronization pattern; and

means for notifying said frequency control means of that the frame

synchronization pattern was detected, if at least one of said eight sequence decision means decides that the frame synchronization pattern is contained;

said second and fourth pattern detection means have each:

eight first rotation sequence decision means for deciding whether the predetermined frame synchronization pattern is contained, by using three of eight digital sequences generated trough conversion by said eight de-mapping means; and

said third and fifth pattern detection means have each:

eight second rotation sequence decision means for deciding whether the predetermined frame synchronization pattern is contained, by using four of eight digital sequences generated through conversion by said eight de-mapping means.

10. A synchronization acquiring circuit according to claim 9, wherein said first and second rotation sequence decision means each have:

delay means for delaying each bit of the digital signal sequence; and

means for deciding whether the predetermined frame synchronization pattern is contained, by deriving the digital signal sequence from said delay means in a manner that the phase of the decision criterion border line rotates in the same direction as a signal reception time lapses.

11. A synchronization acquiring circuit according to claim 10, wherein:

said first rotation sequence decision means of said second pattern detection means and said first rotation sequence decision means of said fourth pattern detection means derive the digital signal sequence from

said delay means in a manner that the phase of the decision criterion border lines rotate in opposite directions as a signal reception time lapses; and

said second rotation sequence decision means of said third pattern detection means and said second rotation sequence decision means of said fifth pattern detection means derive the digital signal sequence from said delay means in a manner that the phase of the decision criterion border lines rotate in opposite directions as a signal reception time lapses.

12. A synchronization acquiring circuit according to any one of claims 7 to 11, wherein said frequency control means comprises:

waveform data making means for creating waveform data to be used for rotating a phase of the baseband signal;

complex calculation means for rotating the phase of the baseband signal by executing a complex number calculation between the waveform data created by said waveform making means and the received baseband signal;

phase error identification means for identifying a phase error by comparing the phase of the baseband signal rotated by said complex calculation means and an absolute phase;

frequency error identification means for identifying a frequency error contained in the baseband signal in accordance with the phase error identified by said phase error identification means; and

carrier recovery means for recovering a carrier to be used for removing the phase error and frequency error contained in the baseband signal, by controlling said waveform data making means in accordance with the phase error identified by said phase error identification means

and the frequency error identified by said frequency error identification means.

13. A synchronization acquiring method of receiving a baseband signal transferred as an intermediate frequency signal obtained by down-converting a received radio wave and for acquiring a radio frequency channel, comprising:

a first pattern detection step of receiving the baseband signal transferred by the intermediate frequency signal in a predetermined frequency range and detecting a predetermined frame synchronization pattern;

a second pattern detection step of receiving, at the same time as said first pattern detection step, the baseband signal transferred by the intermediate frequency signal in a frequency range higher than the frequency range of the intermediate frequency signal transferring the baseband signal from which said first pattern detection step can detect the frame synchronization pattern, and detecting the predetermined frame synchronization pattern;

a third detection step of receiving, at the same time as said first and second pattern detection steps, the baseband signal transferred by the intermediate frequency signal in a frequency range lower than the frequency range of the intermediate frequency signal transferring the baseband signal from which said first pattern detection step can detect the frame synchronization pattern, and detecting the predetermined frame synchronization pattern; and

a carrier recovery step of establishing a frame synchronization and recovering a carrier to be used for removing a frequency error of the baseband signal when one of said first to third pattern detection steps

detects the frame synchronization pattern.